LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims:

1. (Original) A process for the preparation of an erythropoietin (EPO) from a cell or tissue in an in vitro system, comprising the steps of:

(a) providing

(i) at least one first cell or tissue, capable of inducing EPO production in a second cell or tissue, and

(ii) at least one second cell or tissue capable of producing EPO;

(b) culturing the first cell or tissue (i) and the second cell or tissue (ii) in an in vitro system under conditions and for a time suitable to induce EPO production and to express, produce and secrete EPO into the culture medium; and

(c) isolating the EPO produced from the culture medium.

2. (Currently Amended) The [[A]] process according to claim 1 wherein the EPO is a natural or modified EPO.

3. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the first cell or tissue (i) is stimulated to induce the production of EPO in the second cell or tissue (ii).

4. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the first cell or tissue (i) is stimulated by physical stimulation, including electrical stimulation.

5. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the first cell or tissue (i) is stimulated by chemical stimulation, including stimulation with at least one chemical compound.

6. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the first cell or tissue (i) is stimulated by reduced oxygen (O_2) partial pressure.

7. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the induction of the production of EPO in the second cell or tissue (ii) is mediated by a soluble or diffusible factor released by the first cell or tissue (i).

8. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the first cell or tissue (i) is stimulated to induce the production of EPO in the second cell or tissue (ii).

9. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the first cell or tissue (i) is identical to the second cell or tissue (ii).

10. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the first cell or tissue (i) and the second cell or tissue (ii) are selected from the same cell type, wherein the first cell or tissue (i) originates from at least one of a first host ~~and/or~~ and a first species and the second cell or tissue (ii) comprises or consists of cells originating from at least one of a second host ~~and/or~~ and a second species, and wherein at least one of the first host ~~and/or~~ and first species is different from at least one of the second host ~~and/or~~ and second species.

11. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the first cell or tissue (i) is selected from a first cell type and the second cell or tissue (ii) comprises, ~~consist~~ consists of or is selected from a second cell type, wherein the first cell type is different from the second cell type.

12. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the second cell or tissue (ii) is of one cell type or of different cell types.

13. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein at least one of the first cell or tissue (i) ~~and/or~~ and the second cell or tissue (ii) ~~are~~ is selected from the group consisting of organ cultures, primary cells or cultured primary cells, derived from kidney including kindney from an autologous donor, liver, blood cells including lymphocytes, and erythrocytes, bone marrow and/or haematopoietic cells of the human or animal body and/or progenitor cells thereof, immortalised mammalian cell lines including CHO, BHK, LLC-PK1, COS, ~~and~~ mixtures ~~and/or~~ and co-cultures of at least two cell types thereof.

14. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein at least one of the first cell or tissue (i) ~~and/or~~ and the second cell or tissue (ii) ~~comprise~~ comprises at least one recombinant cell or ~~consist~~ consists thereof.

15. (Currently Amended) The [[A]] process according to claim ~~13~~ 14 wherein the recombinant cell is transformed with at least one recombinant nucleic acid molecule encoding EPO or derivates thereof.

16. (Currently Amended) The [[A]] process according to claim 15 wherein the recombinant nucleic acid molecule codes for EPO with a glycoform profile typical for human, horse, bird, dog, or camel, respectively.

17. (Currently Amended) The [[A]] process according to claim 15 ~~or 16~~ wherein the nucleic acid sequence encoding the EPO is under control of at least one of a promoter ~~and/or~~ and an expression control element.

18. (Currently Amended) The [[A]] process according to claim 17 wherein the expression control element is an oxygen responsive element.

19. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein in the in vitro system the culturing of the first cell or tissue (i) and the second cell or tissue (ii) takes place in a shared cell culture compartment.

20. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein in the in vitro system the culturing of the first cell or tissue (i) and the second cell or tissue (ii) takes place in at least two separate cell culture compartments, wherein in a first compartment the first cell or tissue (i) is cultured and the second cell or tissue (ii) is cultured in at least one other compartment.

21. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the in vitro system comprises at least one support for at least one of first cells or tissue ~~and/or~~ and second cells or tissue, as well as one or more cell culture compartments and a culture medium.

22. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein the support is connected or borders at least one side to the cell culture compartment.

23. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein the cell culture compartment is suppliable with liquid culture medium.

24. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein the culture medium contains serum or is serum-free.

25. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein the cell culture compartments are separated from each other by a barrier, which inhibits cell migration from one compartment to another compartment, but which allows the migration or diffusion of molecules from at least one compartment to another compartment.

26. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the in vitro system includes at least one gas compartment which is suppliable with a gas or gas mixture.

27. (Currently Amended) The [[A]] process according to claim 26 ~~any one of the preceding claims~~, wherein the gas compartment is connected with, is corresponding with or borders to at least one of said cell culture compartments, such that at least one gas diffuses across the connection or border between the gas compartment and the cell culture compartment.

28. (Currently Amended) The [[A]] process according to claim 26 ~~any one of the preceding claims~~, wherein the gas compartment is connected with, is corresponding with or borders to at least one culture medium supplied to at least one of said cell culture compartments.

29. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein in at least one said cell culture compartment, at least one of a different culture medium ~~and/or~~ and a different partial pressure of at least one gas is contained in comparison to another said cell culture compartment.

30. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein at least two cell culture compartments are supplied with different gas or gas mixtures.

31. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein in step (b) the culturing is performed under a condition of reduced partial pressure of oxygen prevailing in at least one cell culture compartment.

32. (Currently Amended) The [[A]] process according to claim ~~28~~ 31, wherein the condition of reduced partial pressure of oxygen is prevailing in at least one cell culture compartment for an interrupted period of time.

33. (Currently Amended) The [[A]] process according to claim ~~28~~ 31, wherein the condition of reduced partial pressure of oxygen is prevailing in at least one cell culture compartment for a period of time sufficient to induce or increase the production and/or release of EPO.

34. (Currently Amended) The [[A]] process according to claim ~~28~~ 31, wherein the partial pressure of oxygen is normal or increased in another compartment.

35. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein at least one said culture medium comprises at least one of a ~~one or more~~ growth factor ~~or~~ and a cytokine selected from the group consisting of granulocyte-macrophage colony stimulating factor (GM-CSF), IL-3, granulocyte colony stimulating factor (G-CSF), transformin growth factor-b (TGF-b), platelet derived growth factor (PGF), insulin like growth factor (IGF), acidic fibroblast growth factor (aFGF), basic fibroblast growth factor (bFGF), epidermal growth factor (EGF), hepatocytic growth factor (HGF), keratocyte growth factor (KGF), and neural growth factor (NGF), ~~in particular~~ including GM-CSF, IL-3, and G-CSF.

36. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the cells are cultured in monolayers.

37. (Currently Amended) The [[A]] process according to claim 1 ~~any one of the preceding claims~~, wherein the in vitro system is an artificial organ or an organotypic culture.

38. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein the support is in form of a three-dimensional matrix or scaffold.

39. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein the support comprises or consists of at least one selected from the group consisting of collagen, alginate, cellulose, polyhydroxyalkanoate, proteoglycans, agarose, gelatin, hyaluronan, or derivatives thereof, as well as synthetic polymers including PTFE, vicryl-polydioxanon-copolymers, polyglycolic acid, polyalkylene glycol-aromatic polyester-copolymers, ~~and~~ PE, ~~or a~~ and ~~composite~~ composites ~~of different materials~~ thereof.

40. (Currently Amended) The [[A]] process according to claim 21 ~~any one of the preceding claims~~, wherein the support is in a solid form~~, in particular fibrous or porous form including sponges, foams, porous fabrics,~~ or in a gel form.

41. (Currently Amended) A process ~~to produce~~ for producing at least one selected from EPO in high purity, a subpopulation of EPO glycoforms, an individual EPO glycoform, [[or]] and a mixture of at least two EPO glycoforms, comprising the steps:

(a) to (c) according to claim 1 ~~any one of the preceding claims~~,

and

(d) at least one further purification step selected from the group consisting of reversed phase HPLC, HPLC, immunoaffinity chromatography, immunoaffinity magnetic beads, cation and anion exchange chromatography, hydrophobicity chromatography, hydroxylapatit chromatography, dye affinity chromatography, lectin matrix purification, dihydroxybromyl matrix purification, gel filtration, salting out, precipitation with ammonium sulfate, isoelectric focussing, and [[a]] ~~combination~~ combinations thereof.

42. (Currently Amended) EPO produced by the process of claim 1 ~~according to any one of claims 1 to 39~~.

43. (Original) EPO according to claim 42 comprising or consisting of a subpopulation of glycoforms.

44. (Original) EPO according to claim 42 comprising or consisting of an individual glycoform.

45. (Currently Amended) EPO according to claim ~~any one of claims~~ 42, ~~to 43 being~~ substantially free of human or animal blood products including ~~such as~~ serum albumin.

46. (Currently Amended) EPO according to claim ~~any one of claims~~ 42 ~~to 45 being,~~ wherein said EPO is selected from the group consisting of human EPO, equine EPO, canine EPO, avian EPO, ~~or an~~ and recombinant EPO.

47. (Currently Ameneded) EPO according to claim ~~any one of claims~~ 42 ~~to 46,~~ wherein said EPO is ~~produced by~~ further processed by ~~processing EPO and~~ forming a conjugate thereof ~~of EPO~~ wherein said EPO is covalently linked to polyethylene glycol.

48. (Currently Amended) EPO according to claim ~~any one of claims~~ 42, ~~to 47 that has been further~~ wherein said EPO is modified to at least one of reduce immunogenicity ~~and/or~~ and to prevent adverse effects of an immune response upon administration.

49. (Currently Amended) A pharmaceutical ~~Pharmaceutical~~ composition comprising EPO according to claim ~~any one of claims~~ 42 ~~to 48~~ and ~~one or more~~ at least one of pharmaceutically acceptable excipients ~~and/or~~ and further compounds.

50. (Currently Amended) The pharmaceutical ~~Pharmaceutical~~ composition according to claim 49 wherein the pharmaceutically acceptable excipient is selected from the group consisting of inorganic salts, pH buffers, amino acids, polyols, diluents, solvents, carriers, stabilisers, solubilisers, emulsifiers, preservatives, non-ionic detergents, surfactants, tonicity agents, anti-oxidants, and adjuvants.

51. (Currently Amended) The pharmaceutical ~~Pharmaceutical~~ composition according to claim 50 wherein the pharmaceutically acceptable excipient is selected from the group consisting of sodium chloride, glucose, citrate, acetate and phosphate buffered systems, urea, human, equine or bovine serum albumin, lecithin, polyethylene glycol, mannitol, sorbitol, benzyl alcohol, ethanol, parabens, phenols, cresol, polysorbate 80, polysorbate 20, pluronic F68, glycine, methionine, vitamin C, vitamin A, and vitamin E.

52. (Currently Amended) The pharmaceutical ~~Pharmaceutical~~ composition according to claim ~~any one of claims~~ 49, ~~to 51~~ wherein the compound is selected from the group consisting of amino acids, polyols, antioxidants, vitamins, trace elements, iron, anti-tumor agents, antineoplastic agents, antiproliferative agents, cytostatica, anti-apoptotic agents, toxines, enyzmes, diagnostic imaging or contrast agents, dyes, antibacterial agents, antifungal agents, antiviral agents, cytostatics, immunosuppressive agents, analgesic agents, hormones, anti-inflammatory agents, and haematopoietic agents.

53. (Currently Amended) The pharmaceutical ~~Pharmaceutical~~ composition according to claim 49, ~~any one of claims 49 to 52 being~~ wherein said composition is in an aqueous formulation, is lyophilised, or is spray dried.

54. (Currently Amended) A method for at least one of treating and preventing ~~Use of EPO according to any one of claims 42 to 48 for therapeutic and/or prophylactic treatment of~~ diseases curable with EPO, which method comprises administering to a subject in need thereof a therapeutic or prophylactic amount, respectively, of EPO according to claim 42.

55. (Currently Amended) A method for at least one of treating and preventing a condition selected from the group consisting ~~Use of EPO according to any one of claims 42 to 48 for therapeutic and/or prophylactic treatment~~ of

(a) diseases in connection with anaemia, including nephrogenic anaemia such as CRF related anaemia;

(b) anaemia secondary to treatment with anti-viral drugs, anti-proliferative drugs, anti tumor agents, antineoplastic agents, and immunosuppressive agents;

(c) anaemia secondary to treatment of HIV infection,

(d) anaemia secondary to chemotherapeutic or radiation regimens including chemotherapy and radiation therapy in connection with cancer including myelosuppressive therapy;

(e) anaemia associated with rheumatoid arthritis, prematury, excessive blood loss, myelofibrosis, sickle cell anaemia, bone marrow transplantation, thermal injury, b-thalassemia, and Acosta's disease; and

(f) diseases in connection with acute or chronic ischemic injury of the myocardium, skeletal muscle cells or renal cells[[.]],

which method comprises administering to a subject in need thereof a therapeutic or prophylactic amount, respectively, of EPO according to claim 42.

56. (Currently Amended) A method for at least one of ~~Use of EPO according to any one of claims 42 to 48 for~~ improving peripheral oxygenation, improving physical performance, facilitating presurgical autologous blood donation, ~~and/or~~ and maintaining or increasing hematocrit values in an animal or human body, said method comprising administering to a subject in need thereof an effective amount of the EPO according to claim 42.

57. (Currently Amended) A method for at least one of ~~Use of EPO according to any one of claims 42 to 48 for~~ preventing and treating ischemic acute renal failure, cardiac failure, congestive heart failure, endothelial injury such as inflammation, diseases of the central nervous system, diseases of the peripheral nervous system, and harmful cell apoptosis or necrosis such as in renal tubular cells myocardial cells, muscle cells, liver cells, bone marrow, and in central nervous tissue such as neuronal death in an animal or human body, said method comprising administering to a subject in need thereof an effective amount of the EPO according to claim 42.

58. (Currently Amended) A method for at least one of ~~Use of EPO according to any one of claims 42 to 48 for~~ inducing, stimulating and/or supporting the formation of new blood vessels, neovascularisation, angiogenesis, vasoproliferative processes, neuroprotection, mitosis, proliferation, cell motility, and wound healing in an animal or human body, said method comprising administering to a subject in need thereof an effective amount of the EPO according to claim 42.

59. (Currently Amended) A method of producing a hormonal effect whole comprises using ~~Use of~~ EPO according to claim ~~any one of claims~~ 42 ~~to 48~~ as a hormone.

60. (Currently Amended) The method ~~Use~~ according to claim ~~any one of claims~~ 54 ~~to 59~~, wherein said EPO is administered in a dose from 10 IU to 100 000 IU~~, preferably from 500 IU to 2000 IU~~.

61. (Currently Amended) The method ~~Use~~ according to claim ~~any one of claims~~ 54 ~~to 59~~, wherein said EPO is administered in a dose of 0.5 IU to 2000 IU per kg body weight of said subject.

62. (Currently Amended) The method ~~Use~~ according to claim ~~any one of claims~~ 54~~, to 61 comprising the step of administering~~ wherein said EPO ~~in a therapeutically or prophylactically effective dose, in particular in form of~~ is administered as a pharmaceutical composition comprising said EPO and at least one of pharmaceutically acceptable excipients and further compounds ~~according to any one of claims 42 to 48~~.

63. (Currently Amended) The method ~~Use~~ according to claim 54 ~~any one of claims 52 to 62~~, wherein said EPO is produced by at least one autologous cell or autologous tissue from an animal or human body~~, in particular cultured renal cells,~~ and said EPO is administered to the same animal or human body.

64. (Currently Amended)A method for preparing a ~~Use of EPO according to any one of claims 42 to 48 for the preparation of~~ medicament for ~~the treatment or use according to any one of claims 54 to 63~~ use in at least one of treating and preventing diseases or conditions curable or preventable due to administration of EPO to a subject in need thereof, which comprises including in said medicament the EPO of claim 42.